COTTON - INSECT CONTROL

Excerpts from 1924 Annual Reports of
State and County Extension Agents

Prepared by J. A. Evans, Assistant Chief,
and M. C. Wilson, in Charge,
Division of Reports and Efficiency Studies,
Office of Cooperative Extension Work,
U. S. Department of Agriculture

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Alabama

In anticipation of another heavy infestation of the boll weevil like that of 1923 and other insect damage, a large quantity of calcium arsenate was bought cooperatively early in the year. The per-square application of poison, both by the dry calcium-arsenate and the molasses calcium-arsenate method, was applied by several farmers with satisfactory results. Several dusting machines were bought cooperatively ready to battle the dreaded weevil. The extremely hot, dry weather of June, July, and August did more effectively than man could have done the great and important work of controlling the weevil. Those who still have poison on hand realize that this is purely a seasonal condition and are preserving the poison for another year.

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*No attempt is made to cite all references to insect and disease control in cotton in this circular. Only selected extracts showing typical methods employed and results obtained in a number of States are included. Owing to differences in terminology used in various States and to other local conditions, the information contained herein should be reviewed by the subject-matter specialist concerned before incorporating any part of it in the extension program for the State.

Cotton - Insect Control*

Summary from 1947 Annual Reports of
State and County Extension Agents.

Alabama

In anticipation of another heavy infestation of the boll weevil like that of 1946 and other insects occurred, a large quantity of various pesticides was bought comparatively early in the year. The per-acre application of poisons, both by the dry calcium-arsenate and the calcium-arsenate methods, was applied by several farmers with satisfactory results. Several dusting machines were bought comparatively early to battle the dreaded weevil. The extremely hot, dry weather of June, July, and August did more effectively than man could have done the great and important work of controlling the weevil. There was still less poison used because of the fact that as property's assessed condition and are preserving the poison for another year.

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The average yield per acre of cotton in this county is fully twice that of last year. With only a slight increase in acreage, the county is making about 13,000 bales of cotton this year where it made 6,200 last. This year's crop is equal to the combined crops of 1919, 1920, and 1921. The increase is due to the combined influence of better seed, proper fertilization, improved cultural methods, and more stable economic conditions, encouraging the production of cotton. This crop of cotton has brought about $1,500,000 to the farmers of the county, which has put the entire county in a good condition financially. - E. P. Scott, County Agent, Greene County.

Georgia

The cotton crop this year has been far more satisfactory than it has been in previous years since the invasion of the boll weevil. Our yield this year was some 4,600 or 4,700 bales against 1,800 bales last year. We attribute the difference in the yield to the use of poison, increased amount of fertilizer used, intensive cultivation, and more favorable weather conditions. The marketing of the cotton crop has been materially improved, due to the fact that quite a number of farmers have joined the cooperative marketing association this year. The effort put forth encouraging the use of better cottonseed has resulted in a number of our farmers having several hundred bushels of purebred cottonseed, mostly wilt-resistant varieties for sale. Our cotton leader through his representatives in the county put on quite a campaign during September, encouraging cotton stalk destruction as a means of combating the boll weevil. During the year, at the different stages of the development of the cotton crop, circulars pertaining to the best methods of combating the boll weevil furnished by the National Cotton Growers' Association and the State college of agriculture were mailed to each cotton grower in the county. Eight thousand to 10,000 of the circulars were used in this campaign against the boll weevil. The expense of this work was borne by the Chamber of Commerce. - C. T. Owens, County Agent, Ben Hill County.

Abe says he has eight bales in the warehouse now, owes nothing, and has plenty of poison for the boll weevil stored away for next season. Said if he did not have the poison, he would buy some today.- C. V. Shirley, County Agent, Fayette County.

Telfair county farmers used some calcium arsenate for poisoning the boll weevil in 1918 and happened to get hold of some very coarse, poor material. They did not know very much about using poison then, and they did not get good results. Consequently they were disappointed and did not use any poison for a year or more. They failed to make cotton in 1919 and 1920, but in 1921 and 1922 the seasons were favorable and a good crop was made. This crop was made without poisoning to any large extent. In 1923, a big crop of cotton was planted, and the weather conditions, together with the boll weevil, ruined the crop and only 3,093 bales were ginned in the entire county that year. In 1923, more poison was used than ever before. Three carloads of calcium-arsenate dust were used in the county, besides other poisons. Practically 8,000 bales were ginned in Telfair County in 1924, and at least 60 per cent of the cotton was poisoned or protected from the boll weevil. The 1924 crop was made on one-half the

acreage that the 1923 crop was made on. - Troy Edwards, County Agent, Telfair County.

We received orders for 75 bushels of improved cottonseed, and I gave to several farmers the addresses of parties who sold seed, and a good many seed were shipped in. We ordered 4,500 pounds of calcium arsenate but a good deal more was ordered that I knew nothing about, until I was sent to come and help mix or get started in putting it out. This year I gave 38 poisoning demonstrations. I had eight regular cotton demonstrations with approximately 50 acres that I visited regularly, and five cotton club members. Thus there were 45 farms where boll-weevil poisoning went on in good shape. - H. A. Cliett, County Agent, Wilkinson County.

Louisiana

We worked hard on cotton poisoning. Salesmen went through our section with tin buckets, sifters for dusting; Hills' mixture, boll-we-go, black strap, etc. Some sifting buckets at $5 each were used, but no molasses was used or sprays applied. We have verified the percentage of infestation on a number of plantations and believe that the cotton planters have learned a great deal about the use of calcium-arsenate poisoning to control boll weevil. Of the 11 plats in poisoning only one or two applications were made and these principally to keep the weevil from spreading and to save the young bolls. Dry, hot weather controlled the weevil this year.

The cotton planters of Concordia County bought about 75,000 pounds of calcium arsenate. Of the 75,000 pounds about 25,000 pounds were used, leaving in the hands of the planters a carry over of about 50,000 pounds. Much more would have been bought and used had the weather not controlled the weevil. - C. P. Sead, County Agent, Concordia County.

The boll weevils were not bad this year, and the club members used but little of their calcium arsenate. The production of the cotton club members ranged from 280 pounds of lint per acre to 554 pounds. Only three produced less than 300 pounds of lint cotton per acre. These demonstrations were very gratifying and have caused a great step forward in the cotton industry of the parish. I expect to increase this yield in another year. - Irvin J. Heath, Club Agent, East Baton Rouge County.

As cotton is our principal money crop and as the boll weevil is the most destructive enemy to cotton that we have, the county agent laid his plans and put his best efforts upon the problem of poisoning for the control of boll weevils. We published 15 articles in the local paper, held one parish-wide boll-weevil meeting and 10 community meetings, sent out 1,500 copies of circular letters, induced 62 farmers to buy cooperatively enough calcium arsenate to make a systematic fight against the weevils, obtained local merchants to lay in stocks of poison sufficient to take care of the possible demand for those who did not buy cooperatively, got many farmers to buy dusting machines and saw that local merchants stocked enough machines to take care of the possible demand and, beginning with the first of June, we bagan making systematic surveys of boll-weevil infestations, in order to be able to tell farmers when to begin poisoning.

Each week we visited farmers in every section of the parish and went into the fields and examined the cotton plants in order to determine the infestation. We noticed that about June 10, the weevils began to increase. Every week the infestation would be a little higher until about June 26. On or about that date we found the infestation to run nearly 10 per cent in several fields. We were of the opinion that beginning about a week from that time, we would find the infestation high enough to notify all demonstrators to begin dusting their cotton. We published an article in the local paper to that effect and sent out one circular letter with 100 copies, warning farmers to be on the watch for weevil infestation. To our surprise, our next survey showed a decrease in the weevil infestation. The infestation became lower and lower, week by week, until about the 10th of August there were very few weevils. After that date the infestation increased slightly in a few fields, but as a rule weevils were not plentiful at any time during the year. Only one farmer found the infestation high enough to justify poisoning, and one application checked his weevils. Another farmer who lives in this parish and owns a farm in an adjoining one asked me to go with him to look over his 1,000-acre cotton field. We found a 25 per cent infestation in one field, and enough weevils in 300 acres to warrant poisoning. One to two applications put the weevils under control.

We attribute the low weevil infestation to the continued dry weather, which began early in June and lasted through the entire season.

There is one demonstration that bears us out in this latter statement. One farmer planted one acre on June 7 on good land and irrigated it so as to supply plenty of moisture. The weevils became abundant enough to warrant poisoning with calcium arsenate dust five times. We did not wait for a 10 per cent infestation of puncture squares, but every time we noticed any weevils had flown in from adjoining fields, we applied an application of poison. As a result, we held the weevils under enough control to produce 2,241 pounds seed cotton on the acre. We estimated that the early frost destroyed nearly a half bale per acre of grown bolls that would have opened in another two or three weeks.

This year's experience is going to make it hard for us to get farmers to take proper steps to control weevils next year. Many farmers have reached the conclusion that the time of the boll weevils is about at an end, but our plan is to warn them, on every occasion, that we may have the weevils again next year, and we shall do our part toward getting as many farmers as possible prepared for the weevils if they should begin to do much damage. The fight against the weevil is not over. We believe it has just begun.

Cotton caterpillars showed up in several places this year, but the damage was not enough to justify poisoning on but one farm. That was on the farm of Mr. Jeff Cole near Monroe. We found these insects doing serious damage on some young cotton growing in moist land. We advised dusting with calcium arsenate. One application got the caterpillars under absolute control. - E. R. Strahan, County Agent, Ouachita County.

A campaign was put on in the parish in June by the district agent and county agent. Motion picture films, showing the damages done by the boll weevil and the methods of applying calcium arsenate were shown. The same films were shown earlier in the season in different sections of the parish. The campaign in June proved very effective, due to the fact that many farmers

had been approached by salesmen who were selling inefficient machines for dusting cotton, besides salesmen who had patented medicines or remedies that were guaranteed to exterminate the weevil or catch the weevils. After showing the films that were put out by the U. S. Department of Agriculture, practically all the farmers were convinced that it was not advisable to buy everything that was offered for sale for combating the weevils. They were thoroughly convinced that since they had means of getting correct information from the Department of Agriculture concerning methods and the poisons best adapted to holding down the damages of different insects they would not be misled by every one who had something to sell. This campaign proved a detriment to a few salesmen who had something to sell, but a blessing to the farmer. As a result of the campaign, 46,000 pounds of calcium arsenate were purchased cooperatively. Equally as much more was purchased by large planters or merchants who furnished small farmers.

In view of the fact that there was practically no rain after June 1, the weevil infestation was very much below normal. The agent found one field with an infestation as high as 20 per cent. This field was surrounded by woods which were ideal for hibernating weevils. Besides this the farmer had more land in cotton than he could work effectively or he could have held the infestation down by cultural methods. Since there were practically no boll weevils, and a great many farmers had purchased different kinds of dusting machines and also poison, it was necessary for the agent to keep them from poisoning weevils when there were none to poison. The county agent visited a number of farmers who were ready to begin poisoning and after going over the field with them proved to them that it was not the right time to poison. On only one large plantation was poison used during the season. This was due to the location of the plantation, being near large swamps, timbered tracts, and bayous. This plantation has been poisoning for several years, and the cotton planters are thoroughly convinced of the importance of being prepared to combat the boll weevils in order to protect their cotton crop. - G. D. Cain, County Agent, Richland County.

Mississippi

For early poisoning of boll weevil I used hand shakers molasses calcium mixture and a mop and spray machine. I found the results with all methods used satisfactory. For later dusting on one experiment we used the comet-driven machine and also a number of machines equipped with common orchard spray pump and three nozzles for the distribution of the poison. - C. L. McNeil, County Agent, Madison County.

North Carolina

One hundred and twenty thousand pounds of calcium arsenate was shipped into our county this season. A much larger percentage of our farmers poisoned this year than usual. Many of them poisoned when it was not at all necessary. Many of them applied the material in an unprofitable way, but we had many farmers who poisoned at the right time and in the right way and obtained satisfactory results. - J. W. Cameron, County Agent, Anson County.

Poisoning demonstrations were conducted by four men. At the time of dusting a period of hot weather (dry) started which lasted throughout the usual dusting season, but the results were not considered worth recording. However, the men were convinced that calcium arsenate properly applied would control the weevil. Also, on account of the fear of those dusting that the weevil would literally destroy their crop and that the undusted portions would serve as breeding patches for other fields, it was difficult to get sufficient size plats left undusted for a correct check on the dusting. Next year I believe it will be possible for me to get the kind of dusting demonstrations that should be carried on, if weevils are numerous. The greatest weevil injury in this county came in September, after dusting had ceased, due largely to the continued wet weather, although some sections of the county suffered little damage.

I assisted Messrs. Mabee and Harris in collecting several thousand weevils for hibernation tests. These weevils were collected at Griffin Brothers' gin in Woodville, which is a modern type of gin with supercleaners.

In addition, farmers were advised during the early part of the season to pick up squares and burn them where they did not have sufficient acreage to justify them to poison, or for various reasons would not poison. I also advocated the liberal use of fertilizers, planting only on well-drained soil, using plenty of seed, planting at a safe date on well-prepared soil, and frequent cultivation. Several hundred copies of the North Carolina boll weevil program for 1924 were also distributed among the farmers of the county. - B. E. Grant, County Agent, Bertie County.

A well-planned boll-weevil campaign was carried on during the year. The county was well circularized and meetings held. The newspapers and chamber of commerce cooperated in this work. I assisted the local dealer in getting the agency for good dusting machines and discouraged the use of "fake" remedies. The farmers supplied themselves with machines and calcium arsenate. Forty dusting machines were purchased, most of them being a three-row cart machine, several two-row dusters, a few mule-back dusters, and hand guns. Motion pictures of the boll weevil were shown in most of the schools in the county. Approximately 1,000 people saw these pictures. A very successful counting and dusting demonstration was given with the cooperation of the extension service and local dealer. All the county agents in the neighboring counties, district agent, and extension entomologist attended the demonstration. I estimated 4 per cent of the squares punctured on Monday when the demonstration was arranged for, and the average punctured squares on Friday following the day of the demonstration were 9.9 per cent. This shows how fast the boll weevil works when the weather is favorable.

The agent spent much time in giving counting demonstrations and assisting the farmers in adjusting their machines. No farmer was advised to dust until 10 per cent of the squares were punctured. Due to a spell of dry weather, only a few farmers found it necessary to dust. A few found infestation sufficient to dust in late August with fairly good results. - N. K. Rowell, County Agent, Chowan County.

Boll-weevil control with dry calcium arsenate was used on two farms, and although no exact records were kept, it was plainly visible that the desired results were being obtained. Many farmers inspected these farms and com-

mented on how well the weevil were held in check, and as a result of what they saw 10 big three-row dusters were purchased for the purpose of dusting late fields of cotton. - L. B. Brandon, County Agent, Hoke County.

Twenty-two Niagara dusting machines were purchased by farmers of this county and used in the control of the boll weevil this season, giving general satisfaction to the purchasers. On two demonstrations where we were to obtain the most accurate data an infestation of 32 to 35 per cent existed when dusting began. Within 10 days after dusting was begun, when three applications had been applied, the infestation had been reduced to 3 and 5 per cent, respectively.

The county agent devoted practically all his time to boll-weevil control measures from the 18th of June to the 1st of August in instructing farmers in making infestation counts, showing them how to adjust machines for the best application of the calcium arsenate and other important phases of boll-weevil control. The farmers in this county who properly applied the poison and kept a reasonable check on the work were well pleased generally. Our best available results show that the poisoned demonstrations made 310 pounds more seed cotton than the fields or checks not poisoned. More farmers will poison in this county next season than did this season, because of the results obtained by those who followed directions this year. - S. E. Evans, County Agent, Scotland County.

The county agent prepared a manuscript and through the cooperation of the Elizabeth City banks had a number of posters printed and placed about in the county and adjoining counties, advertising a meeting which was held in Elizabeth City on Tuesday, February 5, 1924, for the purpose of studying and hearing a lecture on the growing of cotton under boll-weevil conditions by W. B. Mabee, Extension Entomologist, Prof. G. M. Garren, and Prof. J. O. Taylor of long experience in the field of operation.

The above incident was the beginning of the county agent's activities toward getting the farmers in this section to realize the problems that we are up against and that we might profit by the experience of those farther south.

The method of growing cotton under boll-weevil conditions was kept constantly before the farmers of this section through the local newspapers and by holding meetings with slides, showing the various stages of development, and their method of destroying the fruit. There were also field meetings held in every section of the county in making counts to determine the time for making the first application of dust.

Dust guns were furnished by local agencies for giving dusting demonstrations and Prof. J. O. Taylor was present during the week, and several demonstrations were conducted with large crowds present to see their first operation.

Boll weevils occurred in patches during the early season but did not cover the county thoroughly until late summer, which is in accordance with reports from other sections. It looked at one time as though we were going to escape heavy infestation, but owing to the lateness of the crop the weevils were in ample time to get a large portion of our crop as many of the farmers had made up their minds they were not going to dust and would quit growing cotton before they would go to all that trouble.

S. H. Reid was one of the first to accept the dusting method but did it for an experiment. He had only 2 acres. From the acre he dusted, 1,600 pounds

were harvested, and the acre left undusted yielded less than one-half of that amount. Therefore, he and his neighbors are convinced that it is profitable to dust when needed. Three applications were used.

Walter Harris reported that he made only one application, but it was just in time to catch the first crop of weevils. From the area dusted a bale per acre was harvested where the nondusted was not more than half as good. In every instance where dust was used this year on a demonstration it showed a profitable investment. While some produced a normal crop others suffered a great loss, but the demonstration results this year will make it much easier during the coming season to get others to fall in line. I am sure the results from dusting would have been greater, but weather conditions were not favorable to the weevil. - Grover W. Falls, County Agent, Pasquotank County.

Oklahoma

Early planting to get ahead of the boll weevil was advocated in winter meetings. Preparations were made to hold dusting demonstrations, but it was not deemed advisable, as a drouth occurred which checked the weevils. They were not so numerous as in the previous years. Dust mulch was practiced, and a few used bushes to shake off while cultivating. Early breaking-under of old cotton fields was advocated this fall. - Curtis Floyd, County Agent, Johnston County.

Before cotton-planting time, with the assistance of E. E. Scholl, Extension Entomologist, I arranged two meetings at Sulphur and Davis for a discussion of the methods used in the control of the boll weevil. We had a total of 86 interested farmers at the two meetings, and Mr. Scholl explained the methods used, but recommended that we use only calcium arsenate molasses mixture in this particular locality, on account of the usual lack of sufficient dew to make the dusting methods practicable.

Later, I took the matter up with the chambers of commerce, and with their support obtained considerable interest in this work, but due to the fact that we did not have a heavy infestation this spring we did not believe it best to urge farmers too strongly in this matter. However, we were able to get about 50 farmers to use the molasses arsenate mixture. As to the concrete benefits of this measure in this particular year it would be hard to make an accurate estimate, but I am of the opinion that it has more than paid for the expense even in this a year of light infestation.

I was very particular to explain to each man who asked for a method demonstration that our entomologist had predicted a light damage by weevil this year, and that it was possible it would not pay so well this year. I believe that each farmer understood this and that practically all who used the measure this year will use it again next year.

The chamber of commerce of Sulphur furnished a supply of calcium arsenate and blackstrap molasses at cost to all farmers who were willing to try this method and did everything possible to aid in the work. The Davis Chamber of Commerce was also very active in this work, and much credit is due it for whatever success we may have had. - Soula E. Lewis, County Agent, Murray County.

South Carolina

Growing cotton, in spite of the boll weevils, is by far one of the biggest problems confronting the farmers of the county. They have met the situation with a knowledge of the boll weevil and a determination to win. They have fought a successful fight, employing almost every weapon or method known. These methods consisted of proper fertilization, cultivation, the use of purebred seed of suitable varieties, and the use of various kinds of poison.

In carrying out the work, this office has cooperated with many farmers throughout the county as well as carried out a systematic campaign with over 130 boys, members of the cotton club.

This county has never suffered great damage from the boll weevils as have some of the neighboring counties, which is due largely to the fact that the individual farmer knew what to do to reduce weevil damage and did it properly. A crop of 50,000 bales is being produced in the county this year.

The boll weevil takes first place among insects. During the cotton-fruiting season, almost my entire time is taken by this work, which consists largely in making infestation counts and conducting poisoning demonstrations. - S. M. Byars, County Agent, Anderson County.

I planned to carry out three thorough boll-weevil control demonstrations in the county in 1924. Several of the largest farmers in the county were also prepared to carry through a dusting program, if necessary. This fall, in accordance with the plan agreed upon at the district agent's meeting of county agents, I instituted a stalk-destruction campaign to control the weevil. I sent out about 1,000 post cards and placed rubber stamps bearing the words "KILL YOUR COTTON STALKS EARLY AND PROTECT NEXT YEAR'S CROP" in the hands of business men and bankers with which to stamp their mail to the farmers. - L. W. Johnson, County Agent, York County.

Tennessee

We have done more work with cotton than with any other farm crop. Our folks have only recently been troubled with the boll weevil and were eager to get some system of cotton raising that would enable them to grow a crop, in spite of the boll weevil. I think the seasons aided our system greatly. I am sure that our biggest work in cotton growing has been that we called the attention of the people to the importance of better stands by advocating thick-spaced cotton. I am firmly convinced that a full stand of cotton will add 20 per cent to the production to the average Tennessee county, and most of the poor stands are avoidable. In addition to the spacing work, we advocated growing cotton on well-drained land of medium fertility, the liberal use of commercial fertilizer, early varieties, and rapid cultivation. We did not advocate the use of poison but rather encouraged its use experimentally. - C. P. Barrett, County Agent, Lincoln County.

Texas

An article explaining control measures to be used against the boll weevil was published in the county newspapers and in the Palestine business league bulletin. - J. T. Carlisle, County Agent, Anderson County.

Fifty-two farmers were influenced to dust or spray their cotton for the control of insects, five of these to control lice by the use of nicotine dust, and good results were obtained. One farmer with 200 acres was given information regarding the control of cutworms on his cotton. The remainder were given help as to the control of the cotton-boll weevil. Three-fourths of these used calcium arsenate dust, and the remainder sprayed their cotton with a liquid spray. The use of the calcium arsenate dust is strongly recommended as that is the treatment which has proved successful both in the U. S. Department of Agriculture tests and also on the farms of the leading cotton growers in this county. But many farmers wanted to spray their cotton and in such cases they were given information as to the material which might prove the most beneficial. Some check was attempted as to results obtained, but it was found that they were dependent largely upon the operator and the farmer. A demonstration was arranged with T. R. Sibson at Santa Rosa along this line; but the rains caused the cotton to grow to stalks and to wash the poison off, and the results were not obtained because the work was not carried on throughout the season. Over two-thirds of all the cotton was either dusted or sprayed with arsenicals and much of this was due to the publicity given through the county agent's office regarding advisability of these control measures for the boll weevil. A county committee to handle the matter with the county agent as chairman of that committee gave out much publicity on this matter. - Louis H. Alsmeyer, County Agent, Cameron County.

Combating insect pests of the cotton crop is of much importance to our people owing to the leading position of the cotton crop in our agriculture. Our work this year was on the following: Boll weevil, cotton hopper or flea, leaf work, and grasshoppers.

Nine result demonstrations in three communities were conducted on boll-weevil poisoning. Two of the communities were located in the Brazos bottom, surrounded by more or less timber. The other was on the prairie. The demonstration in the Adams store community was in a field that was infested heavily with weevil. Two applications of a home-mixed calcium arsenate mixture resulted in increasing yield 30 per cent. There was a rather light weevil infestation in the other communities, and only one application of poison was made.

The fact is clear that the poisoning for weevil will not prove profitable unless there is a heavy infestation, and protracted dry weather is likely to overshadow the effects of poison as a control measure.

Nine method demonstrations were made on the cotton flea. We cooperated with the State entomologist to the extent of calling to his attention the seriousness of the injury that is attributed to this insect, and were able to get him to come to the county and study the situation in the fields. Largely as a result of the injury I was able to point out to him during his visit, he started investigations that by another year will promise to offer some solution.

Two result demonstrations were carried on in comparing the relative efficiency of paris green and zinc arsenate as poison for the leaf worm. Indications are that the latter is a better poison. We demonstrated that it sticks better, is not so likely to burn the leaf, and the cost is somewhat less. It will take some time to get it into general use because our people in looking for worm poison want it to look green. Zinc arsenate is a white

powder, and it will take some education to convince the mass of our farmers as to its great value.

Five method demonstrations in two communities were given on poisoning grasshoppers that were eating up the cotton. These resulted in stopping the damage. - S. A. McMillan, County Agent, Fort Bend County.

During 1923, this section of the State experienced a very bad infestation of insects. We were first confronted with the jumbo hoppers and later with the large yellow-striped flying or differential hopper. After the hoppers the cotton leaf worm invaded the county during August and did much damage to the cotton crop. Some farmers gained experience by poisoning them. Realizing in the beginning that something had to be done and an organized fight against them made in order to save the cotton crop, the extension service through the county agent and the entomologists became busy in the spring as soon as it was determined that hoppers would be with us in dangerous numbers. A joint meeting of business men and farmers was called. Some 250 farmers responded to the call of the county agent to confer on the grasshopper situation. It is useless to say that these men were alarmed over the situation and came to this meeting to do whatever was possible to avert the impending calamity. Mr. Reppert addressed the meeting, outlining the danger of the situation, and recommending control measures which had proved effective in other similar outbreaks of hoppers throughout the county. A committee was formed of three farmers with Mr. Broad as chairman and business men's representative. It was the duty of this committee to meet the next morning and to get the business men to underwrite the cost of a carload of white arsenic and to see that the other necessary ingredients were furnished the farmers at actual cost plus necessary handling charges. The following morning the committee interviewed the business men of Brady and readily had the 30,000 pounds of arsenic underwritten. Some of the business houses put up $100 and some $50. The order for the poison was placed at 12¢ per pound delivered at Brady. Just one week after the poison arrived another order went forward for another 12,000 pounds and very shortly another for 6,000 pounds more, making a total of 48,000 pounds. This poison was sold to the farmers for cash, and the money returned to the merchants. After the season of grasshoppers closed, there were some 5,000 pounds of poison left over which will be on hand next year in case of a similar outbreak.

After procuring the poison the county agent was about the busiest man in the county, demonstrating the methods of mixing and applying the poison mash mixture. The farmers realizing that it was action on their part now, soon acquainted themselves with the process. The hardest and most continuous fight, of course, occurred in those localities where the farms were bordered by pastures and ranches. Here a belt some 50 feet wide or so was sown around the fields, and in many instances this had to be repeated every day or in varying lengths of time up to about four days. The farmers soon learned that if they waited too long to repeat the application the hoppers would make inroads on their cotton, and so they stayed on the job faithfully.

It is hard to estimate the actual saving to farmers on their poison supplies, but suffice it to say that at the time this arsenic was bought the local price was 30¢ per pound. While the bran, molasses, and lemon prices did not run anywhere near this proportion the saving by obtaining same at cost price meant a saving to the farmers at a time when they needed all the en-

couragement that could be given them. There is no question that thousands of bales of cotton were saved by the systematic fight on the hoppers, besides lessening the damage to other crops. You can not find a farmer who had to make the fight who will not tell you that if the situation had not been handled so effectively he would have lost his crop.

Without having been on the ground one can hardly appreciate the destruction of grasshoppers which was wrought in some instances. I have had farmers tell me that several days after placing the poison they would look for some dead animal and after looking along the fence rows find that the foul odor was from the millions of hoppers which were dead in the weeds and grass. Others report that where hoppers had entered their crops they could be raked up from the ground in double handfuls after the poison was applied. The farmers in this county have had some experience now in handling the hoppers and should another outbreak occur next year they will be in good shape to handle the situation. The poison bran method of combating the flying hoppers has proved an absolute success in hundreds of cases in McCulloch County. - George E. Ehlinger, County Agent, McCulloch County.